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ARMY AVIATION TEST BOARD FORT RUCKER ALA
PRODUCT-IMPROVEMENT TEST OF OH-6A HELICOPTER TAIL-ROTOR BALANCE--ETC(U)
SEP 68 J P MAGUIRE

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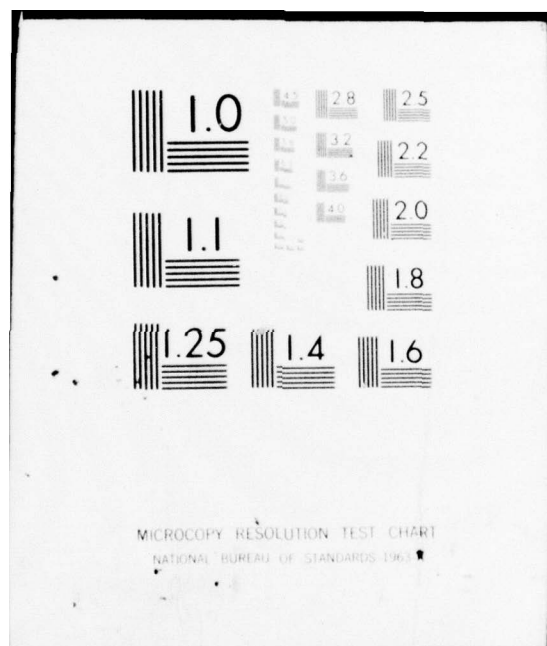
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DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION TEST BOARD
Fort Rucker, Alabama 36360

16 USATECOM-4-6-0251-17

STEBG-TD

SEP 26 1968

SUBJECT: Final Report of Test, 'Product-Improvement Test of OH-6A Helicopter Tail-Rotor Balancing Equipment,' USATECOM Project No. 4-6-0251-17

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1. REFERENCES

- a. Message, AMCPM-LH 01-14009, Commanding General, US Army Materiel Command, 10 January 1968, subject: "OH-6A Tail Rotor Field Balancing Equipment."
- b. Letter, AMSTE-BG, Headquarters, US Army Test and Evaluation Command, 22 January 1968, subject: "Test Directive, Product Improvement Test, OH-6A Tail Rotor Balancing Equipment."
- c. Letter, STEBG-TD, US Army Aviation Test Board, 13 March 1968, subject: "Partial Report of Test, 'Product-Improvement Test, OH-6A Tail-Rotor Balancing Equipment,' USATECOM Project No. 4-6-0251-10."
- d. Letter, STEBG-TD, US Army Aviation Test Board, 31 May 1968, subject: "Final Report of Test, 'Product-Improvement Test, OH-6A Tail-Rotor Balancing Equipment,' USATECOM Project No. 4-6-0251-10."
- e. Letter, AMSTE-BG, Headquarters, US Army Test and Evaluation Command, 15 July 1968, subject: "Test Directive, Product Improvement Test, OH-6A Tail Rotor Balancing Equipment."
- f. Message, AMCPM-LH-L 09-14006, Commanding General, US Army Materiel Command, 12 September 1968, subject: "Shipment of OH-6A Tail Rotor Balancing Kit P/N 369A9999 From Ft. Rucker to RVN."

2. BACKGROUND

- a. Maintenance problems associated with high-frequency vibrations in the OH-6A were encountered in the reliability test program and in tactical use by field units. These vibrations frequently were attributed to improper balance of the tail-rotor assembly. Since this assembly could not be balanced using equipment presently in the Army inventory, the LOH Project Manager requested that the airframe manufacturer develop suitable balancing equipment.
- b. During testing of prototype equipment developed by the manufacturer, the US Army Aviation Test Board (USAAVNTBD) discovered two design deficiencies (references c and d). On 15 July 1968, the US Army Test and Evaluation Command, at the request of the LOH Project Manager, directed the USAAVNTBD to conduct a confirmatory test to determine whether these deficiencies had been corrected (reference e). However, completely

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redesigned equipment was provided for this test. As a result, the USAAVNTBD was directed to conduct a product improvement test on the equipment rather than a confirmatory test.

3. DESCRIPTION

The tail-rotor balancing equipment consists of an accelerometer with mounting bracket, a vibration analyzer, a protractor, and electrical cables, which are contained in a fiberglass carrying case. These items are used in conjunction with the blade-tracking strobe light assembly. Power required for equipment operation is 24 volts' direct current which is obtained from the auxiliary fuel tank connector in the aircraft. (A photograph of the equipment is attached as inclosure 1.)

4. SCOPE

The USAAVNTBD tested the tail-rotor balancing equipment at Fort Rucker, Alabama, and Fort Bragg, North Carolina, for a 53-day period which began 29 July 1968. The test was originally scheduled for 180 days; however the test was terminated so that the test item could be sent to the Republic of Viet Nam (reference f). The equipment was used to balance tail-rotor assemblies on operational OH-6A Helicopters.

5. OBJECTIVE

To determine whether the tail-rotor balancing kit for the OH-6A Helicopter is suitable for Army use.

6. SUMMARY OF RESULTS

- a. No unsafe features were found, and no special safety precautions were necessary.
- b. Weights and dimensions were:

	<u>Length (inches)</u>	<u>Width (inches)</u>	<u>Height (inches)</u>	<u>Weight</u>
Vibration analyzer	15 5/8	6 5/8	5 5/8	8 pounds 8 ounces
Accelerometer	2	3/4	2	2 ounces
Mounting bracket	5 7/8	3 1/2	7/8	3 ounces
Coaxial cable	492	3/8	Attached to analyzer case	
Power Cable	288	1/4	Attached to analyzer case	
Protractor	3 7/8	4	1/16	1 ounce
TOTAL WEIGHT				8 pounds 14 ounces

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- c. The equipment was functionally suitable for restoring the balance of the tail rotor.
- d. Initial inspection of the equipment revealed that the construction was improved over that of the original equipment tested. Durability could not be determined due to short duration of the test.
- e. No maintenance problems were encountered.
- f. A minimum of 45 minutes' classroom instruction and 45 minutes' on-the-job training was required to train operating personnel.
- g. Technical data accompanying the equipment were adequate.
- h. No design deficiencies were discovered; however, one shortcoming was found: The mounting bracket that is intended for use until the tail-rotor gearbox is modified to accommodate the accelerometer can apply excessive pressure to the tail-rotor gearbox output housing. This mounting bracket should incorporate stops that will prevent over-torque pressure from damaging the output housing.

7. CONCLUSION

The tail-rotor balancing kit for the OH-6A Helicopter is suitable for Army use.

8. RECOMMENDATIONS

It is recommended that:

- a. Durability testing be completed when equipment is available.
- b. The shortcoming described in paragraph 6h, above, be corrected as technically and economically feasible.

FOR THE PRESIDENT:

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as

James P. Maguire
JAMES P. MAGUIRE
CWO, USA
Acting Adjutant

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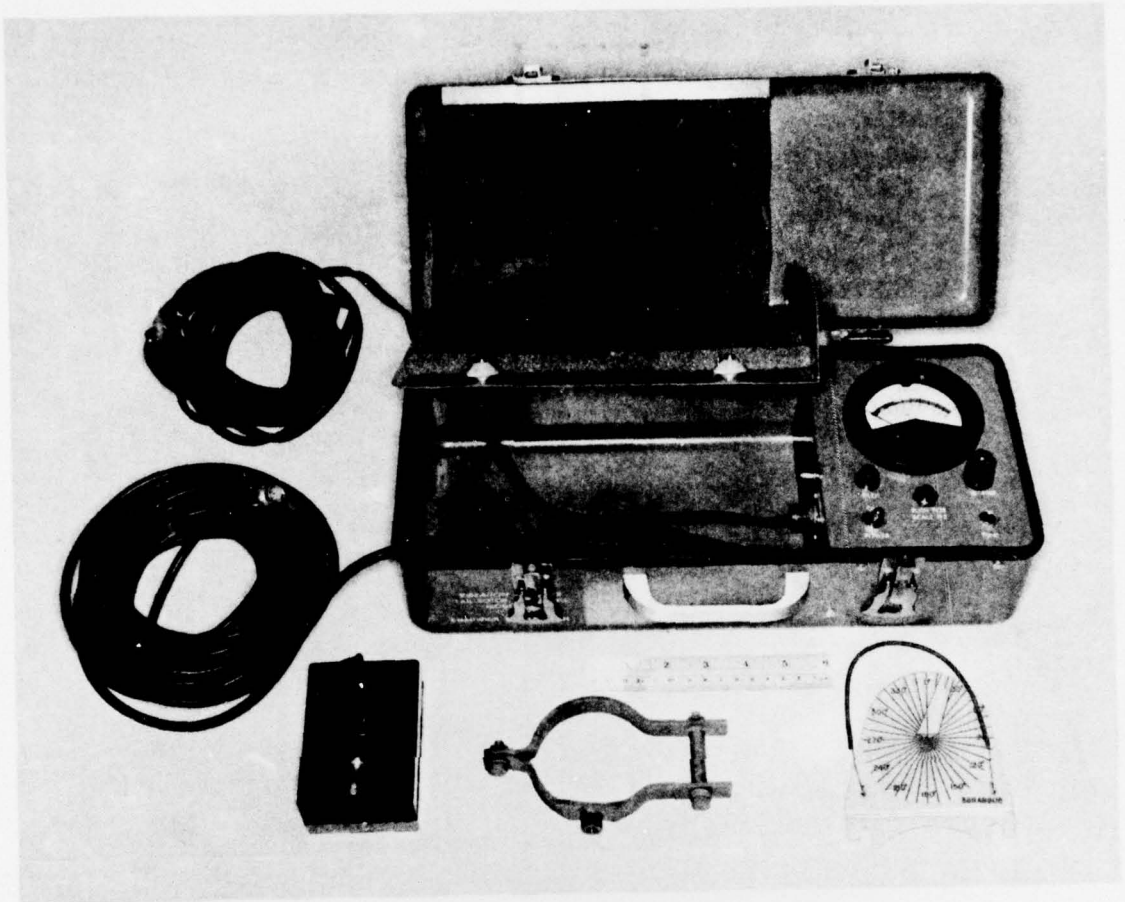
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